Clear Form

Michigan Department of Transportation 5100B (09/06)

CHECKLIST TO DESIGNATE AREAS OF EVALUATION FOR REQUESTS FOR PROPOSAL (RFP)

Exhibit B

MDOT PROJECT MANAGER	JOB NUMBER (JN)	CONTROL SECTION (CS)
Phil Grotenhuis	57152C	24051

DESCRIPTION IF NO JN/CS

MDOT PROJECT MANAGER: Check all items to be included in RFP. WHITE = REQUIRED GRAY SHADING = OPTIONAL Check the appropriate Tier in the box below			**CONSULTANT:** Provide only checked items below in proposal.
☐ **TIER I ($25,000-$99,999)**	☐ **TIER II ($100,000-$250,000)**	☑ **TIER III (>$250,000)**	
☐	☐	☑	Understanding of Service
☐	☐	☑	*Innovations*
☐	☐	☐	*Safety Program*
N/A	☐	☑	Organization Chart
☐	☐	☑	Qualifications of Team
☐	☐	☑	Past Performance
Not required as part of official RFP	Not required as part of official RFP	☐	Quality Assurance/Quality Control
☐	☐	☑	Location. The percentage of work performed in Michigan will be used on all contracts unless the contract is for on-site inspection, then location should be scored for the on-site inspection.
N/A	N/A	☐	Presentation
N/A	N/A	☐	Technical Proposal (if Presentation is required)
3 pages including cover sheet **(No Resumes)**	7 pages	19 pages	Total maximum pages for RFP **not including key personnel resumes**

REQUEST FOR PROPOSAL

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The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is interested in providing services, please indicate your interest by submitting a Proposal, Proposal/Bid Sheet or Bid Sheet as indicated below. The documents must be submitted in accordance with the latest "Consultant/Vendor Selection Guidelines for Service Contracts" and "Guideline for Completing a Low Bid Sheet(s)", if a low bid is involved as part of the selection process. **Referenced Guidelines are available on MDOT's website under Doing Business > Requests for Proposals.**

RFP SPECIFIC INFORMATION

☑ BUREAU OF HIGHWAYS ☐ BUREAU OF TRANSPORTATION PLANNING ** ☐ OTHER

THE SERVICE WAS POSTED ON THE ANTICIPATED QUARTERLY REQUESTS FOR PROPOSALS

☑ NO ☐ YES DATED _____ THROUGH _____

☑ **Prequalifed Services** – See page 4 of the attached Scope of Services for required Prequalification Classifications.

☐ **Non-Prequalifed Services** - If selected, the vendor must make sure that current financial information, including labor rates, overhead computations, and financial statements, if overhead is not audited, is on file with MDOT's Office of Commission Audits. This information must be on file for the prime vendor and all sub vendors so that the contract will not be delayed.

☑ **Qualifications Based Selection** – Use Consultant/Vendor Selection Guidelines

For all Qualifications Based Selections, the selection team will review the information submitted and will select the firm considered most qualified to perform the services based on the proposals. The selected vendor will be contacted to confirm capacity. Upon confirmation, that firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

** **For RFP's that originate in Bureau of Transportation Planning only**, a price proposal must be submitted at the same time as, but separate from, the proposal. Submit directly to the Contract Administrator/Selection Specialist, Bureau of Transportation Planning **(see address list, page 2)**. The price proposal must be submitted in a sealed manila envelope, clearly marked in large red letters **"PRICE PROPOSAL – TO BE OPENED ONLY BY SELECTION SPECIALIST."** The vendor's name and return address MUST be on the front of the envelope. The price proposal will only be opened for the highest scoring proposal. Unopened price proposals will be returned to the unselected vendor(s). Failure to comply with this procedure may result in your bid being opened erroneously by the mail room.

For a cost plus fixed fee contract, the selected vendor must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is assigned a job number so that costs may be segregated and accumulated in the vendor's job-order accounting system.

☐ **Qualifications Review / Low Bid** - Use Consultant/Vendor Selection Guidelines. See Bid Sheet Instructions for additional information.

For Qualification Review/Low Bid selections, the selection team will review the proposals submitted and post the date of the bid opening on the MDOT website. The notification will be posted at least two business days prior to the bid opening. Only bids from vendors that meet proposal requirements will be opened. The vendor with the lowest bid will be selected. The selected vendor may be contacted to confirm capacity.

☐ **Best Value** - Use Consultant/Vendor Selection Guidelines. See Bid Sheet Instructions below for additional information. The bid amount is a component of the total proposal score, not the determining factor of the selection.

☐ **Low Bid** (no qualifications review required - no proposal required.) See Bid Sheet Instructions below for additional instructions.

BID SHEET INSTRUCTIONS

A bid sheet(s) must be submitted in accordance with the "Guideline for Completing a Low Bid Sheet(s)" (available on MDOT's website). The Bid Sheet is located at the end of the Scope of Services. Submit bid sheet(s) separate from the proposal, to the address indicated below. The bid sheet(s) must be submitted in a sealed manila envelope, clearly marked in large red letters **"SEALED BID – TO BE OPENED ONLY BY SELECTION SPECIALIST."** The vendor's name and return address MUST be on the front of the envelope. Failure to comply with this procedure may result in your bid being opened erroneously by the mail room.

Clear Form

PROPOSAL SUBMITTAL INFORMATION

REQUIRED NUMBER OF COPIES FOR PROJECT MANAGER	PROPOSAL DUE DATE	TIME DUE
4	1/17/07	2 PM

PROPOSAL AND BID SHEET MAILING ADDRESSES

Mail the multiple proposal bundle to the MDOT Project Manager or Other indicated below.

☑ MDOT Project Manager ☐ MDOT Other

Phil Grotehuis
Design Division
PO Box 30050
Lansing MI 48909

Mail one additional stapled copy of the proposal to the Lansing Office indicated below.

Lansing Regular Mail	OR	Lansing Overnight Mail
☑ Secretary, Contract Services Div - B225 Michigan Department of Transportation PO Box 30050 Lansing, MI 48909		Secretary, Contract Services Div - B225 Michigan Department of Transportation 425 W. Ottawa Lansing, MI 48933
☐ Contract Administrator/Selection Specialist Bureau of Transportation Planning B340 Michigan Department of Transportation PO Box 30050 Lansing, MI 48909		Contract Administrator/Selection Specialist Bureau of Transportation Planning B340 Michigan Department of Transportation 425 W. Ottawa Lansing, MI 48933

GENERAL INFORMATION

Any questions relative to the scope of services must be submitted by e-mail to the MDOT Project Manager. Questions must be received by the Project Manager at least four (4) working days prior to the due date and time specified above. All questions and answers will be placed on the MDOT website as soon as possible after receipt of the questions, and at least three (3) days prior to the RFP due date deadline. The names of vendors submitting questions will not be disclosed.

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal

MDOT FORMS REQUIRED AS PART OF PROPOSAL SUBMISSION

5100D – Request for Proposal Cover Sheet
5100G – Certification of Availability of Key Personnel

(These forms are not included in the proposal maximum page count.)

Michigan Department of Transportation

SCOPE OF SERVICE
FOR
DESIGN SERVICES

CONTROL SECTION: 24051

JOB NUMBER: 57152C

PROJECT LOCATION:

B01-24051 M-119 over a ravine 0.53 miles north of Pike Road.

PROJECT DESCRIPTION:

The work shall consist of a design for the removal of an earthen fill, replacement with a new wooden bridge and approach work. The bridge has an estimated length of 200 feet. It is anticipated that the main span will be approximately 50 foot long arch and the approach spans will be approximately 25 foot long. The bridge will carry two 10' lanes and have a separated sidewalk on the West side of the structure

PLAN COMPLETION DATE: June 1, 2008

PRIMARY PREQUALIFICATION CLASSIFICATION:

Short & Medium Span Bridges

*** Note: Must also have experience designing wood bridges.**

DBE REQUIREMENT: 5%

MDOT PROJECT ENGINEER MANAGER:

Phil Grotenhuis
MDOT – Design Division
VanWagoner Building
425 W. Ottawa
P.O. Box 30050
Lansing, MI 48909
517-335-6778
517-335-2731
Grotenhuisp@michigan.gov

CONSTRUCTION COST: $1,500,000

The above construction total is the amount of funding programmed for this project. The Consultant is expected to design the project within the programmed amount.

If at any time the estimated cost of construction varies by more than 5% of the current programmed amount, then the Consultant will be required to submit a letter to the MDOT Project Manager justifying the changes in the construction cost estimate.

REQUIRED MDOT GUIDELINES AND STANDARDS:

Work shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards (i.e., Road Design Manual, Standard Plans, Drainage Manual, Roadside Design Guide, A Policy on Geometric Design of Highways and Streets, Michigan Manual of Uniform Traffic Control Devices, etc.).

Consultant is required to use MDOT's current version of Bentley MicroStation for CADD applications and Bentley GEOPAK for road design. Consultant shall comply with all MDOT CADD standards and file naming conventions.

CONSULTANT RESPONSIBILITIES:

The Consultant shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards (i.e., Roadside Design Guide, A Policy on Geometric Design of Highways and Streets, Michigan Manual of Uniform Traffic Control Devices, etc.).

1. A complete design for the bridge and approach work at the above location.

2. Preparation of both contract plans and bid item quantities.

3. Preparation of any specifications and/or special provisions required to supplement MDOT's Standard Specifications for Construction.

4. Soil borings of sufficient depth and number and a geotechnical analysis to perform the foundation designs. For scope of work statement for geotechnical services, see Appendix 5.03.03 A.1.e MDOT Bridge Design Manual.

5. Preparation of permit requests. (MDOT will submit these).

6. Necessary contacts with concerned agencies: e.g. DEQ, municipalities, utilities, railroad, State Historic Commission. All contacts are to be documented. MDOT is to receive copies of minutes, record of conversations or memos documenting all contacts.

7. Participation in meetings and field reviews at the site.

8. Solutions to any unique problems, e.g. utility interference, staging for part width construction.

9. With concurrence from District Traffic Engineer, provide plans and specifications for maintaining traffic during construction.

10. With concurrence from MDOT district traffic engineer, provide traffic control to permit the work described in item 4 & 12.

11. Prepare and submit any information, calculations, hydraulic studies, or drawings required by MDOT for acquiring permits (i.e. NPDES), approvals (i.e. county drain commission) and related mitigation. MDOT will submit permit requests.

12. Any pickup survey or field measurements required to supplement the data provided by MDOT. See survey attachment.

The plans shall be submitted to MDOT as follows:

1. A study showing the conceptual design. This shall be accompanied by a rough (square foot) estimate of cost.

2. Preliminary Plans consisting of a General Plan of Site and a General Plan of Structure of the proposed work and Log of Boring. Preliminary Plans shall be accompanied by an estimate of cost based on the quantities of major pay items shown on the plans.

3. Prefinal plans consisting of final plans that are approximately 90% complete and any special provisions and supplemental specifications that may be required.

4. Final plans and Contract Quantities and any special provisions or supplemental specification that may be required.

The consultant is not authorized to proceed with Preliminary Plans until he receives MDOT approval of the Study. Neither is he authorized to proceed with Final Plans until notified that the FHWA has approved Preliminary Plans.

All work shall conform to AASHTO specifications and MDOT specifications and MDOT design and detailing practices. All submitals to MDOT shall meet the attached quality assurance document. The Consultant shall maintain office records, submit monthly progress reports, and submit MDOT vouchers with their billings. The consultant is advised that MDOT considers plans 5% complete upon approval of the study, 30% complete when the preliminary plans are distributed, and 95% complete when final plans are submitted for review.
The consultant is to show the location and names of all existing utilities within the limits of the

proposed work. The consultant will attend any utility meetings called to insure that the concerns are addressed on the plans involving utilities.

All submitals to MDOT shall be dated and identified by structure number, control section, job number including phase, MDOT contract number, route and location.

All minutes for project related meetings shall be typewritten, recorded, and submitted within two weeks of the meeting.

A file containing project related correspondence, design, and any information resulting from research shall be submitted to MDOT with the final mylars.

MDOT RESPONSIBILITIES:

MDOT will provide:
Standard detail sheets.
Existing Plans

DELIVERABLES:

The Consultant shall deliver all computer files associated with the project in their native format (spreadsheets, CADD files, GEOPAK files, etc.) on DVD, CD or uploaded to ProjectWise, as directed by the MDOT Project Manager. All CADD/GEOPAK files shall be created and identified with standard MDOT file names as shown in Appendix A of the Road Design Manual. It is the Consultant's responsibility to obtain up to date MicroStation and GEOPAK seed/configuration files necessary to comply with MDOT's CADD standards which are posted to the bulletin board system. When the use of GEOPAK road design software is necessary to develop plans all pay items shall be placed into the CADD file using GEOPAK's Design and Computation Manager so that Quantity Manager can be used to transfer pay item information to SAPW/Trns*port. Any CADD/GEOPAK files that do not conform to MDOT standards will be returned to the Consultant for correction at the Consultant's expense.

Proposal documents shall be submitted in their native format with standard naming conventions as well as combined into one Adobe PDF file in the sequence specified by MDOT. To provide text search capabilities the combined proposal shall be created by converting native electronic files to PDF. Scanning to PDF is discouraged except in instances where it is necessary to capturing a legally signed document or a hard copy version of a document is all that exists.

Plan files shall be submitted in their native dgn format with standard naming conventions as well as plotted into a combined Adobe PDF file. Plan sheets shall be plotted to Adobe PDF with full text search and level on/off capabilities in each full size (24" x 36") and half size (11" x 17")

formats. A full size title sheet shall be plotted stamped and signed then scanned for inclusion with the Adobe PDF set. The original title sheet will be sent to the MDOT Project Manager.

Stand Alone Proposal Estimator's Worksheet (SAPW) shall be used to generate the txt and csv files necessary for import into the Trns*port bid letting software. The SAPW files shall be transmitted electronically by the method specified by the MDOT Project Manager.

All plans, special provisions, estimates, and other project related items shall meet all MDOT requirements and detailing practices (i.e., format, materials, symbols, patterns, and layout) or as otherwise directed by the Project Manager.

All plans, specifications, and other project related items are subject to review and approval by MDOT.

P/PMS TASKS

The consultant shall be responsible for the following P/PMS tasks. Descriptions of the tasks can be found on the MDOT Bulletin Board System and can be found under the PPMS library.

P/PMS TASK 3370 - PREPARE STRUCTURE STUDY

P/PMS TASK 3530 - CONDUCT FOUNDATION STRUCTURE INVESTIGATION

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P/PMS TASK 3570 - PREPARE PRELIMINARY STRUCTURE PLANS

P/PMS TASK 3340 - CONDUCT STRUCTURE SURVEY

P/PMS TASK 3390 - DEVELOP THE CONSTRUCTION ZONE TRAFFIC CONTROL CONCEPTS

P/PMS TASK 3552 - DEVELOP PRELIMINARY PERMANENT PAVEMENT MARKING PLAN

P/PMS TASK 3580 - DEVELOP PRELIMINARY PLANS

P/PMS TASK 3822 - COMPLETE PERMANENT PAVEMENT MARKING PLAN

P/PMS TASK 3830 - COMPLETE CONSTRUCTION ZONE TRAFFIC CONTROL PLAN

P/PMS TASK 3840 - DEVELOP FINAL PLANS AND SPECIFICATIONS

P/PMS TASK 3850 - DEVELOP STRUCTURE FINAL PLANS AND SPECIFICATIONS

P/PMS TASK 3870 - HOLD OMISSIONS/ERRORS CHECK (OEC) MEETING

III. PROJECT SCHEDULE

The scheduled plan completion date for this project is **December 2008.** The Consultant shall use the following events to prepare the proposed implementation schedule as required in the Guidelines for the Preparation of Responses on Assigned Design Services Contracts. These dates shall be used in preparing the Consultant=s Monthly Progress Reports.

Target Date	Task #	Description
02/15/2007		Notice to Proceed (approximate date)
03/01/2007		Kickoff Meeting with Consultant Project Managers.
05/01/2007	3370	Prepare Structure Study
09/06/2007	3570	Prepare Preliminary Structure Plans
10/01/2007	3590	Review Preliminary Plans (Grade Inspection - approximate date)
	3850	Develop Structure Final Plans and Specifications
05/15/2007		Submit Final Plan/Proposal Package to MDOT for final review
06/08/2007	3870	Omissions/Errors Check (OEC) Meeting (approximate date)
06/01/2008		Final Construction Plan/Proposal package with recommendations incorporated to MDOT.
07/01/2008		Final Deliverables to MDOT

IV. PAYMENT SCHEDULE

Compensation for this Scope of Design Services shall be on an actual plus fixed fee basis.

V. Project Cost

The estimated cost of construction is: $1,500,000. The above amount is of funding programmed for the construction of this project. If at any time the estimated cost of construction varies by more than 5% of the current programmed amount, the consultant is required to notify the project manager.

VI. Monthly Progress Report

On the first of each month, the Consultant Project Manager shall submit a monthly project progress report to the MDOT Project Manager, ***Phil Grotenhuis.***. The monthly progress report shall follow the guidelines in Attachment “A”.

VII. Format

Full size plans (cut size 24” x 36” consisting of plans sheets and profile sheets will be required.

The plans shall be submitted to MDOT as follows:

1. Preliminary Plans consisting of a General Plan of Site and a General Plan of Structure of the proposed work. Preliminary Plans shall be accompanied by an estimate of cost based on the quantities of major pay items shown on the plans.

2. Final plans and Contract Quantities and any special provisions or supplemental specification that may be required.

The consultant is not authorized to proceed with Final Plans until notified that the FHWA has approved Preliminary Plans.

All work shall conform to AASHTO specifications and MDOT specifications and MDOT design and detailing practices. All submitals to MDOT shall meet the attached quality assurance document. The Consultant shall maintain office records, submit monthly progress reports, and submit MDOT vouchers with their billings. The consultant is advised that MDOT considers plans **30%** complete when the preliminary plans are distributed, and **95%** complete when final plans are submitted for review.

The consultant is to show the location and names of all existing utilities within the limits of the proposed work. The consultant will attend any utility meetings called to insure that the concerns are addressed on the plans involving utilities.

All submitals to MDOT shall be dated and identified by structure number, control section, job number including phase, MDOT contract number, route and location.

All minutes for project related meetings shall be typewritten, recorded, and submitted within two weeks of the meeting. The MDOT Project Manager shall be the official MDOT contact person for the consultant and shall be made aware of all communications regarding this project. The consultant must either address of send a copy of all correspondence to the MDOT Project Manager. This includes all Subcontractor correspondence and verbal contact records.

The Consultant shall contact the MDOT Project Manager whenever discoveries or design alternatives have the potential to require changes in the scope, limits, quantities, costs, or right-of-way of the project.

A file containing project related correspondence, design, and any information resulting from research shall be submitted to MDOT with the final mylars.

CONSULTANT PAYMENT:

All invoices/bills for services must be directed to the Department and follow the 'then current' guidelines. The latest copy of the "Professional Engineering Service Reimbursement Guidelines for Bureau of Highways" is available on MDOT's Bulletin Board System. This document contains instructions and forms that must be followed and used for invoicing/billing; payment may be delayed or decreased if the instructions are not followed.

Payment to the Consultant for Services rendered shall not exceed the "Cost Plus Fixed Fee Not to Exceed Maximum Amount" unless an increase is approved in accordance with the contract with the Consultant. All invoices/bills must be submitted within 14 calendar days of the last date of services being performed for that invoice.

Direct expenses will not be paid in excess of that allowed by the Department for its own employees in accordance with the State of Michigan's Standardized Travel Regulations. Supporting documentation must be submitted, with the invoice/bill, for all billable expenses on the Project. The only hours that will be considered allowable charges for this contract are those that are directly attributable to the activities of this Project. Hours spent in administrative, clerical, or accounting roles for billing and support, are not considered allowable hours; there will be no reimbursement for these hours.

The use of overtime hours is not acceptable unless prior written approval is granted by the MDOT Region Engineer and the MDOT Project Engineer Manager. Reimbursement for overtime hours that are allowed will be limited to time spent on this project in excess of forty hours per person per week. Any variations to this rule should be included in the price proposal submitted by the Consultant and must have prior approval by the MDOT Project Engineer Manager.

ATTACHMENT A

SURVEY SCOPE OF WORK

Survey Limits: As needed for Design, Right of Way, and Construction. A description detailing length, width and cross roads must be included in the Survey Work Plan.

NOTES: The Consultant shall discuss the scope of this survey with an MDOT Region Surveyor or Lansing Design Support Area Surveyor before submitting a priced proposal.

The Consultant surveyor must contact the Region or TSC Traffic and Safety Engineer for work restrictions in the project area prior to submitting a proposal.

A **detailed Survey Work Plan must** be included in the project proposal. A **spreadsheet estimate** of hours by specific survey task such as traversing, leveling, mapping, etc. **must** be included in the **priced proposal**.

It is the responsibility of the Professional Surveyor to safeguard all corners of the United States Public Land Survey System, published Geodetic Control and any other Property Controlling corners that may be in danger of being destroyed by the proposed construction project.

GENERAL REQUIREMENTS:

1. Surveys must comply with **all Michigan law** relative to land surveying.

2. Surveys must be done under the **direct supervision** of a Professional Surveyor licensed to practice in the State of Michigan.

3. Work in any of the following categories of survey: Road Design, Structure, Hydraulic, Right-of-Way, and/or Ground Control (Photogrammetric) must be completed by a survey firm which is pre-qualified by MDOT for that category.

4. Surveys must meet all requirements of the Michigan Department of Transportation (MDOT) Design Surveys *Standards of Practice* dated March 2006, the MDOT Design Survey Manual on-line, and the MDOT RTK guidelines. Please contact the Design Survey office to clarify any specific questions regarding these standards.

5. Consultants must obtain all necessary permits required to perform this survey on any public and/or private property, including an up-to-date permit from the MDOT Utilities

Coordination and Permits Section.

6. Prior to performing the survey, the Consultant must contact all landowners upon whose lands they will enter. The contact may be personal, phone or letter, but must be documented. This notice must include the reasons for the survey on private land, the approximate time the survey is to take place, the extent of the survey including potential brush cutting (which must be minimized), and an MDOT contact person (the MDOT Project Manager or designate).

6. The Consultant must contact any and all Railroads prior to commencing field survey on railroad property. The cost for any permit, flaggers and/or training that is required by the Railroad will be considered as a direct cost, but only if included in the Consultant's priced proposal.

8. The consultant must adhere to all applicable OSHA and MIOSHA safety standards, including the appropriate traffic signs for the activities and conditions for this job.

9. Consultants are responsible for a comprehensive and conscientious research of all records, including MDOT records, essential for the completion of this project.

10. Measurements, stationing, recorded data, and computations must be in International Feet, unless specified otherwise by the Project Manager.

11. Coordinate values shall be based upon the Michigan State Plane coordinate system NAD83, South Zone. A local project coordinate control system is acceptable only on approval of the MDOT Project Manager or the MDOT Supervising Land Surveyor, Region Surveyor, or Survey Consultant Coordinator. All elevations must be based upon the North American Vertical Datum of 1988 (NAVD88). **Other datums must be approved by the MDOT Design Division, Supervising Land Surveyor, or MDOT Region Surveyor.** The datums to be used must be clearly stated in the Survey Work Plan. A preliminary submittal of the adjusted Horizontal and Vertical control for the project may be submitted to the MDOT Survey Consultant Coordinator or Region Surveyor for review and acceptance as soon as it is available.

12. The survey notes must be submitted to the Design Survey Unit in 10" by 12" divided portfolios with flap covers. As many portfolios should be used as are needed to contain all of the required documents and Compact Discs (CD's). **Duplicate CD's must be included in the portfolio, with one set labeled "Region Surveyor".**

13. Each portfolio must be labeled on the outside as in the following example:

Survey Notes for:
Route, Location and Project Limits [I-696 Pedway east of Orchard Lake Road]
Control Section [P02 of 63101] Job Number [56619D] Date [*of submittal*]
By [*Name of Firm*]

Michigan

Professional Surveyor [ ]
License # [ ]

14. Each submittal is to be divided into six sections. These sections are to be labeled as follows: **Administrative, Alignment, Control**, **Property**, **Mapping**, and **Miscellaneous**.

15. **All data**, whether electronic or paper, **must be recorded on non-rewritable Compact Discs** (CD's). All paper files, including MicroStation files, must be scanned and/or converted to Adobe Acrobat .PDF format. CD's must be organized in the same manner as the portfolio, such as by Administrative section, Control section, etc. A Table of Contents in Adobe Acrobat format is required that has all .PDF pages of the CD bookmarked/linked so each place in the .PDF archive can be accessed with a single click of the computer mouse. Specified format files such as ASCII text, CAiCE and MicroStation must have separate access. CD's must be labeled with the control section, job number, data type and file names.

16. Each category of survey must be packaged separately (i.e., Structure surveys separate from Road surveys and Hydraulic surveys). All sheets in a portfolio must be marked with the control section and job number. CD's must be labeled with the control section, job number, data type and file names.

17. The Consultant representative shall record and submit typewritten minutes for all project related meetings to the MDOT Project Manager within two weeks of the meeting. The Consultant shall also distribute the minutes to all meeting attendees.

18. The MDOT Project Manager is the official contact for the Consultant. The Consultant must send a copy of all project correspondence to the MDOT Project Manager. The MDOT Project Manager shall be made aware of all communications regarding this project. Any survey related questions, in regard to this project, should be directed to a Survey Consultant Coordinator or MDOT Region Surveyor.

19. The Survey Consultant Coordinator for this project is Thomas Bogren, 517-335-1914 or e-mail bogrent@michigan.gov. The North Region Surveyor is Ray Kihn, 989-731-5090 ext 334, or e-mail kihnr@michigan.gov.

At the completion of this survey for this project, legible copies of all field survey notes, all electronic data, and all research records obtained for this project will be considered the property of MDOT and **must be sent to** the MDOT, Design Support Area, Supervising Land Surveyor, P.O. Box 30050, Lansing, MI 48909. Please use MDOT's Form 222(3/99) entitled "SURVEY NOTES: RECEIPT AND TRANSMITTAL" for all transmittals. A copy of this transmittal form must also be sent to the MDOT Project Manager for Design.

Acceptance of this survey by the MDOT Supervising Land Surveyor and/or the MDOT

Project Manager does not relieve the Consultant of any liability for the content of the survey.

WORK RESTRICTIONS

The Selected Consultant, and the Selected Consultant only, is advised to discuss Traffic Control scenarios with the MDOT North Region Traffic and Safety Engineer prior to submitting a priced proposal.

No work on state trunk lines shall be performed or lane closures allowed during the Memorial Day, July 4th, or Labor Day holiday periods, as defined by the MDOT Project Manager or representative specifically designated by the Project Manager.

The Consultant must call the MDOT Region or TSC Traffic and Safety Engineer before beginning work to inform him of surveying activity in the area. The MDOT Region or TSC must be notified at least two weeks prior to lane closures so advance notice can be posted on the Web site.

Traffic shall be maintained by the Consultant throughout the project in accordance with Sections 812, 922, 103.05 and 103.06 of the *Standard Specifications for Construction*, 2003 edition, www.mdot.state.mi.us/specbook/, and Supplemental Specification 03SS001(2) Errata to the 2003 Standard Specifications and all other supplemental specifications currently in effect against the Standard Specifications for Construction. All traffic control devices shall conform to the current edition, as revised, of the *Michigan Manual of Uniform Traffic Control Devices* (MMUTCD). All warning signs for maintenance of traffic used on this project shall be fabricated with prismatic retro-reflective sheeting, and shall be set up five feet above ground.

The Consultant shall use MDOT standard "maintaining traffic" typicals for any and all closures. Typical MDOT traffic control diagrams are available on line at www.mdot.state.mi.us/tands/plans.cfm

FIELD SURVEY

The purpose of the field survey is to obtain all information and data required by the project design engineer, to leave control in the field for future construction staking, and to provide a sufficient history of the area to enable the MDOT Design Survey Unit to perform dependable surveys in the future. The Consultant surveyor must discuss the scope of this survey with the project design engineer before initiating any work on this project. Notes of this meeting and a detailed Survey Work Plan with an estimate of hours broken down by specific survey task must be submitted to the MDOT Project Manager and Survey Consultant Coordinator within two weeks of this meeting.

CONTROL

A three dimensional control system must be established throughout the project area. This control shall be based on the Michigan State Plane Coordinate System NAD1983 (2003) horizontal

datum and NAVD 1988 vertical datum. All subsequent control must be based on the established control. Any traverse points or bench marks established must adhere to the Michigan Department of Transportation (MDOT) Design Surveys *Standards of Practice* dated April 1, 1998 and be listed in the Control pocket of the portfolio. Contact the Survey Consultant Coordinator for existing control in the area.

If GPS-derived elevations are used, the Surveyor's Report and the Witness List and Witness Sheet for the project must clearly state that the vertical datum is "NAVD 1988 GPS-derived from Geoid 03."

OPUS positioning may be used as a check, and for positioning Primary Control as defined in the MDOT Standards of Practice for Design Survey March 2006. For any and all OPUS solutions, a RINEX format file with a minimum of two hours of GPS data must be included, as well as the OPUS solution from NGS. All OPUS solutions must be verified within 0.20 foot, either by a separate OPUS position from an independent occupation, or by a NGS/CORS adjustment.

PROPERTY

Any PLSS corners within the project limits or in danger of obliteration by impending project construction must be recovered or established and tied to the project coordinate system.

All PLSS corners must be recorded in accordance with PA 74 of 1970, as amended, and all applicable administrative rules. A copy of each recorded Land Corner Recordation Certificate must be submitted to the MDOT Design Survey Office as part of the final report. All PLSS corners located in hard surface roads must be protected by a monument box, regardless of impending construction. The consultant shall provide to the Survey Project Manager a list of any affected Government or Property Controlling Corners in the detailed work plan for discussion or approval.

The Consultant surveyor must contact the County Remonumentation Representative prior to beginning work on the project to inform him of proposed corner perpetuation activities, and to obtain information pertinent to PLSS corners and/or property controlling corners affected by project construction.

The Consultant must provide property corner ties on the project coordinate system, and a means to relate the point numbers to the properties, such as a marked up map from the Department of Equalization, and/or plats and Certificates of Survey marked with point numbers. The Consultant must also provide copies of pertinent plats, Certificates of Survey, and easements of record.

The Consultant must provide landowners names, addresses and phone numbers in the four quadrants of the project.

ALIGNMENT

The Consultant must develop a **legal centerline alignment** for M-119. On all references to the alignment, whether text listings or in a MicroStation drawing, the alignment must noted as "Legal Alignment for CS24051 as surveyed in 2006."

At least two **alignment control points must be found or set,** and witnessed, on each tangent. These points must be intervisible and not be more than one kilometer apart. The alignment points may be set on an offset to the true alignment. If this is done, the project surveyor must certify that the line is a true parallel offset. Tangent offsets must be set on the side of M-119 that will be least impacted by impending road construction. The alignment notes must include an **ASCII list** of the state plane coordinates with combined Scale Factor and at least four witnesses for each alignment control point set or found.

All **legal alignment points are to be filed on Land Corner Recordation Forms** at the appropriate County Courthouse, since they are Property Controlling Corners. Recorded copies of the LCRC's must be included in the portfolio.

The Consultant is requested to match existing stationing as closely as possible from old plans and/or the ROW sheets, and to show and explain the source of stationing on the alignment sketch. A detailed explanation of how the alignment was established, along with all documentation, is required as part of the surveyor's report.

The Consultant must include a **sketch** or **CADD drawing of the alignment** in the portfolio, showing stationing, horizontal coordinates, curve data (Radius, Delta, Tangent length, PC station, PI station and PT station), alignment points found or set, and the source of stationing.

The Right of Way through the project area must be defined and shown on all drawings.

The Consultant must show the centerline alignment in the CAiCE file and on the MicroStation drawings produced for this project, using the Feature Code of SCL for the alignment chain.

PROPERTY

The property section is comprised of all government corner and property information required for this project. This includes all pertinent recorded Land Corner Recordation Certificates and ties to the project coordinate system for found or set monuments.

GOVERNMENT CORNERS

Any Public Land Survey System (PLSS) corners within the project construction limits must be recovered or established and tied to the project coordinate system. Any PLSS corners needed to establish the alignment are required, as are any PLSS corners in danger of obliteration by impending road construction.

Any PLSS corners within the project limits, or needed for any and all Real Estate transactions for the project, must be recovered or established and tied to the project coordinate system. All PLSS corners must be verified to the Professional Surveyor's satisfaction and recorded in accordance

with **PA 74 of 1970**, as amended, and all applicable administrative rules. A copy of each **recorded** Land Corner Recordation Certificate must be submitted to the MDOT Design Survey Office as part of the final report. Four valid witnesses must exist in the field, or a new LCRC with four valid witnesses must be filed. All PLSS corners located in hard surface roads must be protected by a monument box, regardless of impending construction.

It is the responsibility of the Project Surveyor to coordinate all such activities with the Emmet County Remonumentation Representative, Richard Oelke, P.S., phone 231-348-0434. Validating the corner locations through the Emmet County Remonumentation Peer Group is optional but not required.

A **list of all government corners** used must be developed which includes datum, corner designations, descriptions, coordinates, combined Scale Factor, and witnesses.

The Consultant must also tie in any property corners found in the M-119 project area that may be necessary to aid MDOT Real Estate calculations for ROW acquisitions. The Consultant must also provide a coordinate list with a means to relate the coordinates to the drawing such as plats, tax maps or Act 132 Certificates marked with the point numbers.

MAPPING

The Consultant must provide planimetric mapping and Digital Terrain Modeling (DTM) to enable design of the timber structure. This will include mapping on M-119 from Right of Way to Right of Way, the existing culvert, and anything else that would impact the project and environmental assessment. Full DTM mapping should be done from 250 feet to 250 feet north of the structure site, 100 feet in width each side. From 650 feet south to 250 feet south of the existing structure site full DTM mapping should extend 10 feet past the Right of Way. From 600 feet north to 250 feet north of the existing structure site full DTM mapping should extend 10 feet past the Right of Way. Hard surface shots should extend north and south of the previously defined full DTM areas to reach 1000 feet from the structure site.

The Consultant must submit an **archived CAiCE software file, named 57152C.zip**, of all survey mapping points and data files for the mapping area. A Digital Terrain Model (DTM), named EX and created in CAiCE, must be included for the appropriate mapping areas. **The CAiCE software used must be Version 10.2 or newer.**

POST SURVEY CLEAN-UP

Once the survey is complete, all wooden stakes must be removed to aid the maintenance crews and adjacent property owners. All benchmarks and control points and their witnesses must remain in place.

FINAL REPORT: DELIVERABLES

The Final Report for this project shall include:

1. In the first pocket of the portfolio, labeled **ADMINISTRATIVE**, the following will appear:
   a. MDOT's Form 222(3/99) entitled "SURVEY NOTES: RECEIPT AND TRANSMITTAL"
   b. The project's **Professional Surveyor's Report** on company letterhead consisting of:
      i) A comprehensive synopsis of the work performed on this project, signed **and sealed** by the project's Professional Surveyor.
      ii) The source and methods used to establish the project horizontal and vertical control and alignment(s) for this project.
      iii) A detailed explanation of anything discovered during the survey of this project that may create a problem for the designer or another surveyor.
   c. **CD with all documents scanned** or converted into PDF files. Each page must be inserted in a master PDF file and bookmarked for easy retrieval. An example can be provided upon request.

2. In the second pocket of the portfolio, labeled **ALIGNMENT**, the following will appear:
   a. A **sketch or CADD drawing** of the alignment(s) with:
      i) A statement defining the alignment(s) as **legal**
      ii) Stationing, source of stationing, and station equation to existing stationing
      iii) Horizontal coordinates
      iv) Curve data
      v) Alignment points found or set
      vi) Reference lines and angles of crossing (if appropriate)
   b. **Witness list for the alignment points** found or set, which shows coordinates, stationing and four witnesses for each alignment point
   c. **LCRC's** for alignment points found and/or set.

3. In the third pocket of the portfolio, labeled **CONTROL**, the following will appear:
   a. Documentation of **horizontal and vertical datum sources**.
   b. **OPUS** documentation
   c. **Least squares adjustments** for the horizontal and vertical control.
   d. Text files in ASCII format, hard copy and on CD, which contain the **witness lists** for the horizontal alignment ties, horizontal control points, benchmarks and government corners.

4. In the fourth pocket of the portfolio, labeled **PROPERTY**, the following will appear:
   a. Property ties to the project coordinate system with maps, plats, and recorded surveys marked with point numbers.
   b. Legible **recorded** copies of all Land Corner Recordation Certificates (**LCRC**) filed for the government corners (PLSS corners and Property Controlling Corners) used for computations and/or in danger of obliteration by impending construction.

5. In the fifth pocket of the portfolio, labeled **MAPPING**, the following will appear:
   a. An archived **CAiCE** software file.
   b. All field survey notes, electronic data and research records obtained for the project. It is not necessary to submit electronic raw survey data in hardcopy form.
   c. All supporting and supplemental information or data.

6. In the sixth pocket of the portfolio, labeled **MISCELLANEOUS**, the following will appear:
   a. Any photographs taken for clarity of an area
   b. Any newspaper clippings related to the project
   c. Any information not covered in this scope that will be of benefit to the designer or another surveyor

General Notes

a. It is the responsibility of the consultant to insure that all electronic files submitted to MDOT conform to the required format and that all documents are legible.
b. The consultant must organize and label the various sections of the portfolio as required by the Standards of Practice for MDOT Design Surveys dated March 2006.
c. All research documents are required to be scanned and placed on the CD.
d. It is desirable to limit paper and to include as much electronic data as possible on Compact Disc or DVD, including scanned items, to facilitate future electronic storage and transmission of survey data. **Duplicate CD's must be included in the portfolio, with one set labeled "Region Surveyor".**

ATTACHMENT "B"

MONTHLY PROGRESS REPORTS

This attachment shows the necessary layout of the Monthly Progress Reports.

Control Section 00000
Job Number 00000C
Structure Number S00
Date 00/00/00

MONTHLY PROGRESS REPORT

A. Work accomplished during the previous month.

B. Anticipated work items for the upcoming month.

C. Real or anticipated problems on the project.

D. Update of previously approved detailed project schedule (attached), including explanations for any delays or changes.

E. Items needed from MDOT.

F. Copy of Verbal Contact Records for the period (attached).

Structure Number - Control Section - Job Number
Route, Location Description
Design Schedule as of 00/00/95

Original Authorized Date	(Anticipated) or **Actual** Dates	
00/00/00	**00/00/00**	Initial project meeting.
00/00/00	**00/00/00**	Completion of Pre-Grade Inspection.
00/00/00	**00/00/00**	First maintaining traffic coordination meeting.
00/00/00	**00/00/00**	Completion of design survey.
00/00/00	**00/00/00**	Submittal of preliminary plans for geometric review.
00/00/00	(00/00/00)	Submit request for soil borings and soils recommendations.
00/00/00	(00/00/00)	Submittal of Preliminary Right-Of-Way Plans.
00/00/00	(00/00/00)	Submittal of Grade Inspection materials.

VERBAL CONTACT RECORD **Control Section** 12345
Job Number 11111C
Structure Number S02
Date 07/31/95

Joe Engineer talked to Tom Myers and decided to use a 0.05'/ft super on ramp A leading into the bridge.

ATTACHMENT "C"

CONSTRUCTION CRITICAL PATH NETWORKS

I. INTRODUCTION

The Consultant is required to submit a Construction Critical Path Network at various points in the design process. Refer to the following:

P/PMS TASK 3580 - DEVELOP PRELIMINARY PLANS

P/PMS TASK 3830 - COMPLETE THE CONSTRUCTION ZONE TRAFFIC CONTROL PLAN

P/PMS TASK 3840 - DEVELOP FINAL PLANS AND SPECIFICATIONS

Construction Critical Path Networks are often needed to develop the progress schedule for a project. They are required on any project designated to include an Incentive/Disincentive or Special Liquidated Damages clause. Construction Critical Path Networks are also recommended for projects with the following characteristics:

1. New construction.
2. Major reconstruction or rehabilitation on an existing roadway that will severely disrupt traffic.
3. Unique or experimental work.
4. More than one construction season.
5. Complex staging(multiple stages with traffic shifts).

As noted in MDOT=s Construction and Technology Instructional Memorandum 1997-7, Progress Schedule Determinations/Critical Path Rates,

> A*preparation of a Critical Path is a requirement on <u>all</u> consultant-designed projects, regardless of the project type or complexity*.@

The MDOT Resident Engineer assigned to the project should be consulted when developing Construction Critical Path Networks.

MDOT requires the precedence diagramming method. The Consultant will submit this network in MPX version 4.0.

II. NETWORK DEVELOPMENT

The network will be defined using the following steps.

1. Activity definition.
2. Activity sequencing.
3. Duration estimation.
4. Schedule development.

1. ACTIVITY DEFINITION

The Consultant will define the specific activities in enough detail so that the proper objectives will be met. The Consultant must identify assumptions (those factors considered true, real or certain). Supporting detail for the activities should be documented and organized as needed to simplify the review of the activities by MDOT personnel.

The Construction Critical Path Network must start with the ALetting Date@ as the first activity and terminate with the AEnd of Project@ as the finish activity.

A sufficient number of activities will be required with sufficient detail so that the controlling construction operation(s) may be identified. Notation on each activity shall include a brief work description and activity time duration.

2. ACTIVITY SEQUENCING

Activity sequencing involves identifying and documenting interactivity dependencies. The Consultant must sequence activities accurately to support later development of a realistic and achievable construction schedule. Two types of dependencies should be considered. Mandatory dependencies are inherent in the nature of the work being done, such as construction sequencing. Discretionary dependencies are based on the knowledge of the work to be done. Constraints are used to show how the activities relate to each. The

Consultant must include documentation supporting all discretionary dependencies used in the project. All activities must lead to another activity.

3. DURATION ESTIMATION

After the Consultant has sequenced the activities, the Consultant should determine the activity duration. Activity duration estimating involves assessing the number of work periods likely to be needed to accomplish each activity. The approved MDOT production rates will be used in estimating activity duration. These are available in the Supplemental Information section of this appendix. The Consultant must document and submit all assumptions made during the duration estimation to MDOT.

4. SCHEDULE DEVELOPMENT

The activity sequencing, duration estimations and the calendars are combined to create the construction schedule. During the development of the schedule the Consultant will verify:

1. The required schedule to build the project.
2. The constructability of the project.
3. If the maintaining traffic scheme will work.
4. If seasonal limitations will affect the construction.
5. Any other project specific considerations.

The MDOT Calendars will be used by the Consultant in developing the network. The calendars are based on a 4, 5 or 6 day work week. The MDOT Calendars are included in the Supplemental Information section of this appendix.

At this point there should be no negative float in the network. If there is, there is an error in the network and the error must be corrected before network submittal.

III. DELIVERABLES

After this final step the design consultant will submit the finished CPM schedule to MDOT

1. Documents

A. 11" x 17" plot of the network. The critical path shall be clearly identified on the plot. A larger plot may be required for complex networks.

B. Work Day / Completion Date Determination Worksheet.

C. List of any other assumptions or controlling factors used in creating the network. For example, permit or maintaining traffic restrictions.

2. Electronic Format

This section sets the requirements for the electronic submittal of the Consultant=s Construction Network. All networks shall be submitted on a 3.5 inch floppy disk (or via E-mail) using one of the following formats:

A. **Standard Electronic Media Format:** This is a standard ASCII text file containing the data elements below, in the order specified. This file can be created using any text editor or word processing application (i.e., MS-Word, WordPerfect, Notepad, Write) but must be saved as an ASCII file.

The **first line** will provide a descriptive header describing the submittal and containing:

Control Section
Job Number
Route
Consultant name
Date of Submittal

The next line will be **blank**, followed by multiple data lines.

Each **data line** will contain one record pertaining to one task of the job. Separate data fields by a comma. Fields within each task line are as follows:

(Note that the term "task" is synonymous with "activity." Leave fields that are not required blank)

(1) Task # (Job # followed by a hyphen followed by this task's unique 4 digit task number. This is the Preceding Event Activity Code)
(2) Description of Task, Milestone or Hammock, blank if this record is a constraint
(3) Calendar (see attached list)
(4) Duration of task, blank for constraints
(5) Task # of the next task (Succeeding Event) - leave blank if this record is not a constraint or hammock
(6) Type of constraint (FS, SS, SF, HAM) - leave blank if this record is not a constraint or hammock. A hammock is a special type of constraint that groups several tasks together. The hammock starts with the start of the first task in the group and finishes with the finish of the last task.
(7) Delay, if required
(8) Original "Baseline" Start Date
(9) Original "Baseline" Finish Date
(10) Current (forecast) Start Date (early start)

(11) Current (forecast) Finish Date (early finish)
(12) Estimated completion date (if different from early start + current duration)
(13) Late Start Date
(14) Late Finish Date
(15) Actual Start Date
(16) Actual Finish Date

Example - each line contains the following:

Task # (preceding event), Description, Calendar, Duration, Next Task # (succeeding event), Constraint Type, Delay, Baseline Start, Baseline Finish, Early Start, Early Finish, Estimated Completion Date, Late Start, Late Finish, Actual Start, Actual Finish, Total Float.

B. **Primavera Project Planner(P3) 2.0 Export Procedure:** Users who have Primavera Project Planner(P3) version 2.0 can automatically create a export file by following the below export procedure below. **Users having an older version of Primavera may use the applications export feature only if they are able to include all the data elements listed in the version 2.0 format.**

1. Choose Tools, Project Utilities, **EXPORT**
2. Click **ADD**, then click **OK** to accept the next sequential ID number, or type a unique number to identify the specifications and click **OK**
3. Enter a description for the specification in the Title field
4. Specify data items to export

Activities
- Select **Contents of List**
- Use the Description column to specify which data items to export
- To add items, click the right mouse button in the Description column and choose from the list. Suggested Items include: **Activity ID, Activity Description, Actual Start, Actual Finish, Calendar ID, Early Start, Early Finish, Late Start, Late Finish, Original Duration.**
- Select **All Current, All Target**, or **All Target2**
- Set Description Length to 48

OR

Constraints
- Select **Successor relationships** - Choose this option to export Activity IDs and their corresponding successors only. Lags and relationship types will also be displayed in this output file.

5. Click **FORMAT** in Export Dialog Box
6. In the Output file section, enter a new name and path (ex. A:\actexp or A:\conexp). Do not include a file extension.
7. In the type field, click the minimize button and choose the **[.PRN] - ASCII** file format for the output file.
8. Select **CALENDAR** for Date Format
9. Set ASCII Output Field Separation to **1** and Blank column width to **0**
10. Click **RUN**
11. In the Output Options dialog box, click on **OK**

NOTE: A COMPLETED FILE EXPORT WILL CONSIST OF 2 EXPORT FILES (ACTIVITIES & CONSTRAINTS)

C. **Microsoft Project Export Procedure:** Users of Microsoft Project Version 4.0 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In the Save File as Type box Select **MPX 4.0**
3. On the drive box select a: or whichever drive is the 3.5" Floppy drive
4. Click on **OK**

This saves the file in MPX format.

D. **Primavera Sure Track:** Users of Sure Track Version 2.0 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In the filename box input a filename
3. In the Save File as Type box Select **MPX**
4. On the drive box select a: or whichever drive is the 3.5" Floppy drive
5. Click on **OK**

This saves the file in MPX format

E. **Scitor Project Scheduler 7 Export Procedure:** Users of Scitor Project Scheduler Version 7 and above can create a Microsoft Project Exchange (MPX) file by following the procedure below.

1. Choose File, Save As from the main menu
2. In filename box select a filename
3. In the Save File as Type box Select MPX
4. On the drive box select a: or whichever drive is the 3.5" Floppy drive

5. Click on **OK**
This saves the file in MPX format

F. **Export Files with Other Scheduling Applications:** Most scheduling packages have export functions similar to those described above. If the Consultant chooses to use packages with export capabilities, they shall include all items listed in the Standard Media Format in a text or ASCII type file.

IV. SUPPLEMENTAL INFORMATION

A. MDOT CRITICAL PATH-CONSTRUCTION TIME ESTIMATES

Drainage

Cross Culverts	
Rural Highways	40 m/day
Expressways	50 m/day
Large Headwalls	5 days/unit
Slab or Box Culverts	5 days/pour
Plowed in Edge Drain(production type project)	4500 m/day
Open Graded Underdrain(production type project)	1200 m/day
Sewers	
0m-5m(up to 1500mm)	40 m/day
0m-5m(over 1500mm)	25 m/day
5m-over(up to 1500mm)	25 m/day
5m-over(over 1500mm)	20 m/day
Jacked-in-place	13 m/day
including excavation pit & set up	min. 5 days
Tunnels	
hand mining	8 m/day
machine mining	20 m/day
including excavation pit & set up	min. 5 days
Manholes	3 units/day
Catch Basin	4 units/day

Utilities

Water Main(up to 400mm)	100 m/day
Flushing, Testing & Chlorination	4 days
Water Main(500mm-1050mm)	25 m/day
Flushing, Testing & Chlorination	5 days
Order & Deliver 600 mm HP Water Main	50 days/order
Gas Lines	100 m/day

Earthwork and Grading	**Metro Exp**	**Rural**
Embankment(CIP)	1500 m3/day	5300 m3/day
Excavation and/or Embankment(Freeway)	1500 m3/day	9200 m3/day
Excavation and/or Embankment(Reconstruction)	750 m3/day	3800 m3/day
Embankment(Lightweight Fill)	300 m3/day	600 m3/day
Muck(Excavated Waste & Backfill)		1500 m3/day
Excavation(Widening)		600 m/day
Grading(G & DS)		750m/day

Subbase and Selected Subbase(up to 7.4m)	600 m/day
Subbase and Selected Subbase(7.4 m & over)	450 m/day
Subgrade Undercut & Backfill	1500 m3/day
Subbase & Open-Graded Drainage Course	450 m/day

Surfacing

Concrete Pavement(7.3m)	450 m/day
Including Forming & Curing	min. 7 days
Bituminous Pavement(7.3m)	1200 m/day/course
Concrete Ramps(4.9m)	300 m/day
Including Forming & Curing	min. 7 days
Curb(1 side)	750 m/day
Concrete Shoulder-Median	1200 m2/day
Bituminous Shoulders(1 side per course)	750 m/day
Sidewalk	180 m2/day
Sidewalk(Patching)	65 m2/day

Structures

Sheeting(Shallow)	30 m/day
General Excavation at Bridge Site	750 m3/day
Excavation for Substructure(Footings)	1 unit/day
Piles(12m)	15 piles/day
Substructure(Piers & Abutments)	5 days/unit
Order and Delivery of Beams	
Plate Girders	100-120 days/order
Rolled Beams	90-120 days/order
Concrete Beams	50 days/order
Erection of Structural Steel	3 days/span
Bridge Decks	
Form & Place Reinforcement(60m Structure)	15 days
Pour Deck Slab(1 1/5 days/pour)	2 days/span
Cure	14 days
2 Course Bridge Decks	
Add 9 days for Second Course Latex	
Add 12 days for Second Course Low Slump	
Sidewalks and Railings	
Sidewalks and Parapets	5 days/span
Slip Formed Barriers	2 days/span
Clean Up	10 days
Pedestrian Fencing	
Shop Plan Approval & Fabrication	1-2 months

Erection	1 week/bridge
Rip Rap Placement	
Bucket Dumped	385 m^3/day
Bucket Dumped and Hand Finished	131-523 m^3/day
Retaining Walls	1 Panel/day min. 10 days
Railroad Structures	
Grade Temporary Runaround	750 m3/day
Ballast, Ties & Track	50 m/day
Place Deck Plates	5 days/span
Waterproof, Shotcrete & Mastic	5 days/span
Railroad Crossing Reconstruction	10-15 work days (depends on if concrete base is involved)
Temporary Railroad Structures	
Order & Deliver Steel	55 days/order
Erect Steel	1 day/span
Ties and Track	3 days/span
Pumphouse	
Structure	30 days/m
Order & Deliver Electrical & Mechanical Equipment	90 days
Install Electrical & Mechanical Equipment	30 days
Miscellaneous	
Removing Old Pavement	60 m/day
Removing Old Pavement for Recycling(7.3m)	450 m/day
Crushing Old Concrete for 6A or OGDC	1350 mtons/day
Removing Trees(Urban)	15 units/day
Removing Trees(Rural)	30 units/day
Removing Concrete Pavement	450 m2/day
Removing Sidewalk	250 m2/day
Removing Curb & Gutter	450 m/day
Removing Bituminous Surface	1600 m2/day
Conditioning Aggregate	900 m/day
Bituminous Base Stablizing	2500 m2/day
Ditching	600 m/day
Trenching for Shoulders	750 m/day
Station Grading	610 m/day

Clearing	8000 m2/day
Restoration(Topsoil, Seeding, Fertilizer & Mulch)	1650 m2/day
Sodding	2100 m2/day
Seeding	40000 m2/day
Guard Rail	230 m/day
Fence(Woven Wire)	360 m/day
Fence(Chain Link)	150 m/day
Clean Up	600 m/day
Concrete Median Barrier	300 m/day
Cure	min. 7 days
Reroute Traffic(Add 4 days if 1st item)	1 day/move
Concrete Glare Screen	450 m/day
Light Foundations	6 units/day
Order & Delivery	6-8 week/order
Remove Railing & Replace with Barrier(1 or 2 decks at a time)	4 days/side
Longitudinal Joint Repair	1600 m/day
Crack Sealing	4800 m/day
Joint and Crack Sealing	500 m/day
Repairing Pavement Joints - Detail 7 or 8	200 m/day
Seal Coat	6400 lane m/day
Diamond Grinding/Profile Texturing Concrete	3300 m2/day
Rest Area Building	
Order Material	3 months
Construct Building	9 months
Tower Lights	
Order and Deliver Towers	100 days
Weigh-In-Motion	
Order and Deliver Materials	1 month-6weeks
O & D with Installation	3 months
Raised Pavement Markers	300 each/day
Attenuators	2 each/day
Shoulder Corrugations, Ground or Cut	8 km-9.7 km/side/day
Aggregate Base	2900 m^2/day
Aggregate Shoulders	350 m^3/day
Freeway Signing - 3# Post Type	50 signs/day

Concrete Joint Repair(High Production-Projects with > 1000 patches)

Average(1.8m)	50 patches/day
Large(>1.8m)	500 m2/day

Bridge Painting 90 m2/day

Pin and Hanger Replacement 3 beams/day
Order Pin & Hanger 60 days

Bridge Repair
Scarifying(Including Clean up) 10000 m2/day
Joint Removal(Including Clean up) 4 m/day
Forming & Placement 3.5 m/day
Hydro-Demolishing 300 m/day
Barrier Removal 15 m/day
Placement 45 m/day
Hand Chipping (Other than Deck) .24 m^3/person/day
Shoulder Corrugations, Ground or Cut 8 km-9.7 km/side/day
Casting Latex Overlay 250 m/day
Curing Overlay
Regular 4 days
High Early 1 day
Thrie Beam Retrofit 30 m/day
Beam End Repairs
Welded Repairs .75 days/repair
Bolted Repairs .50 days/repair
Bolted Stiffeners (Pair) .25 days/repair
Grind Beam Ends .25 days/repair
Welded Stiffeners (Pair) .25 days/repairH-Pedestal Repairs:
Welded Repair .50 days/each
Replacement 1 day/each
Deck Removal 235 m^2/day

Surfacing-Bituminous
Metro-Primary(<18000mtons)
Paving 540 mtons/day
Joints 150 m/day
Cold Milling 3400 m2/day
Aggregate Shoulders 900 mtons/day
Metro Primary(>18000mtons)
Paving 540 mtons/day
Joints 200 m/day
Cold Milling 7500 m2/day
Metro Interstate(>18000mtons)
Paving 1100 mtons/day
Joints 360 m/day
Aggregate Shoulders 900 mtons/day

Urban Primary(<18000mtons)	
Paving	640 mtons/day
Joints	100 m/day
Cold Milling	1700 m2/day
Rubblizing	1700 m2/day
Aggregate Shoulders	450 mtons/day
Urban Primary(>18000mtons)	
Paving	1000 mtons/day
Joints	120 m/day
Cold Milling	1700 m2/day
Aggregate Shoulders	500 mtons/day
Urban Interstate(>18000mtons)	
Paving	1200 mtons/day
Joints	220 m/day
Cold Milling	1700 m2/day
Rubblizing	5800 m2/day
Aggregate Shoulders	640 mtons/day
Rural Primary(<18000mtons)	
Paving	640 mtons/day
Joints	120 m/day
Cold Milling	590 mtons/day
Crush & Shape	10000 m2/day
Aggregate Shoulders	640 mtons/day
Rural Primary(>18000mtons)	
Paving	1100 mtons/day
Joints	150 m/day
Cold Milling	800 mtons/day
Crush & Shape	10000 m2/day
Rural Interstate(>18000mtons)	
Paving	1280 mtons/day
Joints	220 m/day

B. WORKSHEET

WORK DAY/COMPLETION DATE DETERMINATION

CS: _____ JN:

DESCRIPTION OF WORK: _____

MAJOR WORK ITEM	PRODUCTION QUANTITY	RATE	ESTIMATED TIME

TOTAL ESTIMATED TIME:

COMPLETION DATE: _____ (Calendar Days or Work Days)

COMMENTS:

_____

_____

_____

_____

_____

C. MDOT CALENDARS

The following are the MDOT 4, 5 and 6 day calendars:

CALENDAR	DESCRIPTION	START	FINISH
1	Std - Apr 16 - Nov 15 - 4 day	APR 16	N0V 15
2	LP - Bit Stab - 4 day	MAY 15	OCT 15
3	UP - Bit Stab - 4 day	JUN 01	OCT 01
4	LP S of M-46 - Bit Pave - 4 day	MAY 05	NOV 15
5	LP N of M-46 - Bit Pave - 4 day	MAY 15	NOV 01
6	UP - Bit Pave - 4 day	JUN 01	OCT 15
7	LP - Bit Seal Coat - 4 day	JUN 01	SEP 15
8	UP - Bit Seal Coat - 4 day	JUN 15	SEP 01
9	Tree Planting - Deciduous - 4 day	MAR 01 OCT 01	MAY 15 NOV 15
10	Tree Planting - Evergreen - 4 day	MAR 01	JUN 01
11	South LP - Restoration - 4 day	MAY 01	OCT 10
12	North LP - Restoration - 4 day	MAY 01	OCT 01
13	UP - Restoration - 4 day	MAY 01	SEP 20
14	Full Year - Winter Work - 4 day	JAN 01	DEC 31
21	Std - Apr 16 - Nov 15 - 5 day	APR 16	NOV 15
22	LP - Bit Stab - 5 day	MAY 15	OCT 15
23	UP - Bit Stab - 5 day	JUN 01	OCT 01
24	LP S of M-46 - Bit Pave - 5 day	MAY 05	NOV 15
25	LP N of M-46 - Bit Pave - 5 day	MAY 15	NOV 01
26	UP - Bit Pave - 5 day	JUN 01	OCT 15
27	LP - Bit Seal Coat - 5 day	JUN 01	SEP 15
28	UP - Bit Seal Coat - 5 day	JUN 15	SEP 01
29	Tree Planting - Deciduous - 5 day	MAR 01 OCT 01	MAY 01 NOV 15
30	Tree Planting - Evergreen - 5 day	MAR 01	JUN 01

31	South LP - Restoration - 5 day	MAY 01	OCT 10
32	North LP - Restoration - 5 day	MAY 01	OCT 01
33	UP - Restoration - 5 day	MAY 01	SEP 20
34	Full Year - Winter Work - 5 day	JAN 01	DEC 31
35	Full Year - Expedited - 6 day	JAN 01	DEC 31